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FILE

87-268 ✓

Jan. 14, 1988

Policy and Rules Division,

Mass Media Bureau of FCC

1919 M Street, N.W., Washington D.C. USA

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MAR - 4 1988

Federal Communications Commission
Office of the Secretary

Dear Sirs

We, Hitachi, Ltd., want to ask you to file reply comments on the response to the NOI, MM Docket 87-268 of FCC. So, we are enclosing our reply comments and 11 copies of them.

Yours faithfully,

A handwritten signature in cursive script, appearing to read 'Takahiko Fukinuki'.

Takahiko Fukinuki, PhD.

Chief Researcher

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Federal Communications Commission
Office of the Secretary

Reply Comments on
the Response to the NOI, MM Docket No. 87-286 of FCC

Jan. 10, 1988
Hitachi, Ltd.

Technical Questions about
the Statement on the Hitachi System

Regarding the statement about the Hitachi system, described in the response to NOI, No. 9, which was submitted to FCC by Prof. Schreiber on November 17, 1987, some questions have been left. They are as follows.

[PART 1]: Regarding the article, "Performance of Proposed EDTV and HDTV", on page 4.2-5;

[1] Prof. Schreiber says, "This scheme uses a second sub-carrier, similar to the color subcarrier, permitting about 1.2 MHz of additional signal of reduced amplitude".

In reality, however, about 2.1 MHz of additional signal is inserted, since Single-Side-Band signal of Amplitude-Modulated high resolution components is inserted from 2.1 MHz to 4.2 MHz of the existing NTSC signal [1,2]. The bandwidth could be more than 2.1 MHz, if the interference to existing TV sets were neglected.

In addition, reduction of amplitude is not essential in the experiments done so far, although it might be desirable. In reality, the signal is halved, since a Single Side Band signal of amplitude modulated high resolution components is multiplexed into the existing 4.2 MHz, as mentioned above.

[2] He says, "The Sarnoff system uses such a carrier to add more than 2 MHz".

In the Sarnoff system, only about 1 MHz of additional signal is permitted theoretically, because it is modulated with Double Side Bands in order to multiplex two independent signals.

[3] He says, "This is done at the expense of diagonal luminance resolution of moving objects and of vertical chroma resolution".

In the case of the Sarnoff system, the component 1 is intra-field averaged. Therefore, it might be true. In the Hitachi system, however, it is not true.

The reasons are as following:

First, why is the luminance resolution of moving objects lost, especially in the case of the Hitachi system?



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In the NTSC standards, the resolution of moving objects has been already lost by color components. The high resolution components are multiplexed in the three-dimensional areas symmetrical with the color components. There are no additional losses at all.

Second, there are no additional reductions of the vertical chroma resolution caused by the features of the proposed system. As is well known, the vertical chroma resolution should be and can be reduced by half. It should be reduced, because, if the vertical resolution is not band-limited, picture degradation is annoying, when color signals are demodulated with 2D comb filters. In addition, this can be reduced, because the horizontal chroma resolutions have been reduced much in comparison with the luminance signal.

[4] He says, "Three-dimensional filtering with frame stores is required at both transmitter and receiver".

It is true at receivers. At transmitters, however, the filtering is desirable but not required.

The so-called IDTV(Improved TV), in which frame stores are adopted for 3D Y/C separation and progressive scanning, is similar to the proposed EDTV, in terms of its hardware. This IDTV will be on sale this spring for home use.

[5] He says, "Because of increased cross color and cross luminance, the enhancement signals must be of low amplitude and thus cannot be used to add side signals".

Generally speaking, it is desirable that the enhancement signals are low.

However, it is not clear whether it is stated absolutely or in comparison with other systems such as the Sarnoff system.

In the Hitachi system, the multiplexed signal is correlated with the base signal, while, in the Sarnoff systems and Matsushita system, uncorrelated signals are multiplexed. As is well known, uncorrelated signals are more visible and more annoying, theoretically and practically.

[PART 2]: Regarding the table of the article, "Advanced Television Systems and Their Impact on the Existing Service", on page 3-10;

In addition to the questions mentioned in the part 1, there are many questions, such as;

[1] The first question is, why the compatibility of the system 6 is "7", while that of the system 10 is "6".

[2] The second question is, why the receiver complexity of the system 6 is "8", while that of the system 10 is "7".



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As a matter of fact, the complexity of receivers with wide aspect ratio is much more than that with normal ratio, since the time axis expansion in the former needs many complicated circuits. Therefore, the ACTV is much more complicated than the Hitachi system.

In Japan, the so-called IDTV (Improved TV) will be on sale by the spring of 1988, where, display with progressive scanning and 3D Y/C separation are conducted. The EDTV proposed by Hitachi, i.e., the system 6, is similar to the IDTV in terms of its hardware. Hence, the EDTV sets can be implemented with little addition of circuits to the IDTV sets.

For further information, please contact Dr. Takahiko Fukinuki, Chief Researcher, the Central Research Laboratory, Hitachi, Ltd., Kokubunji, Tokyo 185 JAPAN.

References

1. T. Fukinuki and Y. Hirano; "Extended Definition TV Fully Compatible with Existing Standards", IEEE Trans, Communications Vol. Com-32, No. 8, pp. 948-953, (Aug. 1984)
2. T. Fukinuki, Y. Hirano and H. Yoshigi; "Experiments on Proposed Extended Definition TV with Full NTSC Compatibility", SMPTE J, Vol. 93, No. 10, pp. 923-929, (Oct. 1984)

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